

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC., SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

FIRSTFACE CO., LTD.,
Patent Owner.

IPR2019-00612
Patent 8,831,557 B2

Before JUSTIN T. ARBES, MELISSA A. HAAPALA, and
RUSSELL E. CASS, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Apple Inc., Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (collectively, “Petitioner”) filed a Petition (Paper 3, “Pet.”)

requesting *inter partes* review of claims 1, 8, 9, and 15 of U.S. Patent No. 8,831,557 B2 (Ex. 1101, “the ’557 patent”) pursuant to 35 U.S.C. § 311(a). On August 5, 2019, we instituted an *inter partes* review as to all challenged claims on all grounds of unpatentability asserted in the Petition. Paper 11 (“Decision on Institution” or “Dec. on Inst.”). Patent Owner Firstface Co., Ltd. subsequently filed a Patent Owner Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 17, “Reply”), and Patent Owner filed a Sur-Reply (Paper 20, “Sur-Reply”). An oral hearing was held on May 5, 2020, and a transcript of the hearing is included in the record (Paper 25, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 8, 9, and 15 are unpatentable.

B. Related Matters

The parties indicate that the ’557 patent is the subject of the following district court cases: *Firstface Co., Ltd. v. Samsung Electronics Co., Ltd.*, Case No. 18-cv-02243 (N.D. Cal.), and *Firstface Co., Ltd. v. Apple Inc.*, Case No. 18-cv-02245 (N.D. Cal.). *See* Pet. 3; Paper 22, 2. Petitioner filed a second petition challenging claims 1, 8, 9, and 15 of the ’557 patent, premised on a different interpretation of the claim term “simultaneously” than the one asserted in this proceeding, which was denied. *See Apple Inc. v. Firstface Co., Ltd.*, IPR2019-00611, Paper 11 (PTAB Aug. 5, 2019).

C. The '557 Patent

The '557 patent discloses a mobile communication terminal with “an activation button configured to switch from an inactive state . . . to an active state,” where “a predetermined operation is performed simultaneously with switching to the active state by pressing the activation button.”

Ex. 1101, Abstract. According to the '557 patent, adding functionality to a mobile communication terminal, to be performed when the terminal is in an active state, typically required adding an “interface or button for performing the function.” *Id.* at col. 1, ll. 34–40. At the same time, terminal users often perform the actions of “habitually taking out and activating the terminal[] on the move or in a standby state while carrying the terminal[].” *Id.* at col. 1, ll. 45–48. The '557 patent seeks to take advantage of that habitual use by “connecting various operations to the activation button provided in a terminal” and performing a predetermined function whenever the user presses the activation button. *Id.* at col. 1, ll. 52–56.

Figure 1 of the '557 patent is reproduced below.

FIG. 1

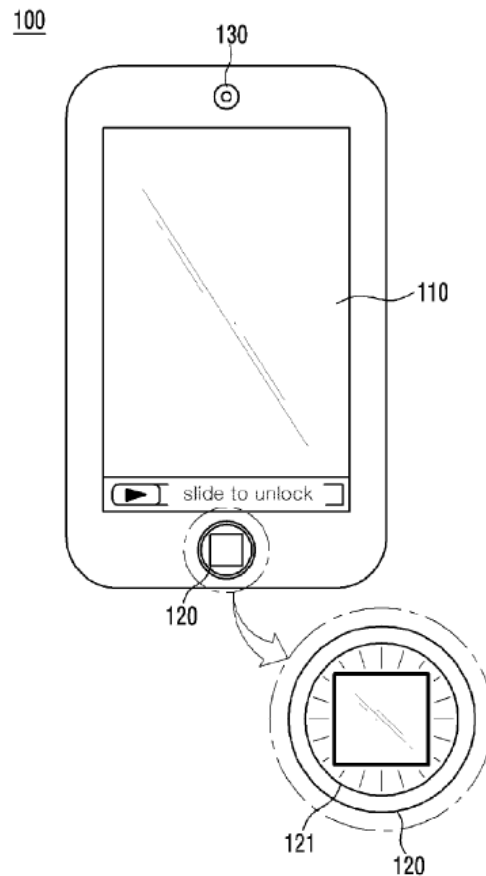


Figure 1 depicts mobile communication terminal 100 comprising camera 130, display unit 110, activation button 120, and sub-display unit 121. *Id.* at col. 3, ll. 51–55, col. 5, ll. 7–9. “[D]isplay unit 110 displays various information regarding operation states of the mobile communication terminal 100, and also displays an interface for a user’s input if the mobile communication terminal 100 drives a touch screen.” *Id.* at col. 4, ll. 3–6. When the user presses activation button 120, mobile communication terminal 100 switches from the inactive state (in which the terminal is communicable but the display screen is turned off) to the active state (in which the display screen is turned on). *Id.* at col. 3, ll. 28–46, col. 4,

ll. 27–35. Figure 1 above, for example, “illustrates a state in which a lock screen is displayed on the display unit 110 after pressing the activation button 120 when the mobile communication terminal 100 is in the inactive state.” *Id.* at col. 4, ll. 32–35. If the user presses activation button 120 when mobile communication terminal 100 is in the inactive state, mobile communication terminal 100 may perform a “predetermined operation” (set in advance by the user) “simultaneously with switching to the active state.” *Id.* at col. 2, ll. 1–17, col. 4, ll. 40–50. Mobile communication terminal 100 also may perform different operations depending on either the number of presses or the press time of activation button 120. *Id.* at col. 4, l. 50–col. 5, l. 6.

The ’557 patent describes a number of operations that can be performed when activation button 120 is pressed. *Id.* at col. 5, ll. 44–49. For example, a “user authentication process can be performed for security by pressing the activation button 120.” *Id.* at col. 7, ll. 4–7. When in the inactive state, mobile communication terminal 100 “senses whether or not the user has pressed the activation button” and, if so, performs a “user identification function.” *Id.* at col. 7, ll. 14–19. User identification unit 420 of mobile communication terminal 100 may use camera activation element 421, iris detection element 422, and user identification element 423 to sense and recognize the iris of a user’s eye. *Id.* at col. 7, ll. 20–50. The ’557 patent explains that “other authentication methods, for example, an authentication key matching method, a password matching method, a face recognition method, a fingerprint recognition method, and the like, can be used” instead of the iris recognition method. *Id.* at col. 8, ll. 3–8.

D. Illustrative Claim

Claims 1 and 9 of the '557 patent are independent. Claim 8 depends from claim 1, and claim 15 depends from claim 9. Claim 1 recites:

1. A mobile communication terminal comprising:
 - a display unit; and
 - an activation button configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit; and
 - a user identification unit configured to operate a user identification function,
- wherein the user identification function is performed simultaneously with switching from the inactive state of the display unit to the active state of the display unit by pressing the activation button,
- wherein the user identification function includes a fingerprint recognition.

E. Evidence

The pending grounds of unpatentability in the instant *inter partes* review are based on the following prior art:

U.S. Patent Application Publication No. 2010/0017872 A1, published Jan. 21, 2010 (Ex. 1113, “Goertz”);

U.S. Patent Application Publication No. 2009/0083850 A1, published Mar. 26, 2009 (Ex. 1105, “Fadell”);

International Patent Application Publication No. WO 2010/126504 A1, published Nov. 4, 2010 (Ex. 1106, “Gagneraud”);

German Patent Application Publication No. DE 19710546 A1, published Sept. 17, 1998 (Ex. 1114, “Herfet”);¹ and

¹ We refer to “Herfet” as the English translation of the original reference (both provided as Exhibit 1114). Petitioner includes a declaration in Exhibit 1114 attesting to the accuracy of the translation. *See* 37 C.F.R. § 42.63(b).

IPHONE USER GUIDE FOR IPHONE OS 3.1 SOFTWARE
(2009) (Ex. 1107, “iOS”).

Petitioner filed declarations from Benjamin B. Bederson, Ph.D. (Ex. 1103), Michael Hulse (Ex. 1104), and Yosh Moriarty (Ex. 1131) with its Petition and a reply declaration from Dr. Bederson (Ex. 1139) with its Reply. Patent Owner filed a declaration from Alfred C. Weaver, Ph.D. (Ex. 2001), with its Response.

F. Asserted Grounds

The instant *inter partes* review involves the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 8, 9, 15	103(a) ²	Fadell, iOS, Gagneraud
1, 8, 9, 15	103(a)	Goertz, Herfet

II. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art for a challenged patent, we look to “1) the types of problems encountered in the art; 2) the prior art solutions to those problems; 3) the rapidity with which innovations are made; 4) the sophistication of the technology; and 5) the educational

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 103 and 112. Because the challenged claims of the ’557 patent have an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 103 and 112.

level of active workers in the field.” *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 666–667 (Fed. Cir. 2000). “Not all such factors may be present in every case, and one or more of them may predominate.” *Id.*

Petitioner argues that a person of ordinary skill in the art at the time of the ’557 patent would have had “a bachelor’s degree in Computer Science, Computer Engineering, or equivalent and at least two years of relevant experience in the fields of user interface design and mobile devices, or otherwise equivalent industry experience in the relevant field.” Pet. 13–14 (citing Ex. 1103 ¶¶ 29–30). Patent Owner does not dispute Petitioner’s proposed level of ordinary skill in the art. PO Resp. 15 (citing Ex. 2001 ¶¶ 34–36). Based on the full record developed during trial, including our review of the ’557 patent and the types of problems and prior art solutions described in the ’557 patent, we agree with Petitioner’s assessment of the level of ordinary skill in the art and apply it for purposes of this Decision.

B. Claim Interpretation

In an *inter partes* review based on a petition filed on or after November 13, 2018, we interpret the claims of the challenged patent

using the same claim construction standard that would be used to construe the [claims] in a civil action under 35 U.S.C. 282(b), including construing the [claims] in accordance with the ordinary and customary meaning of such [claims] as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)).

“In determining the meaning of [a] disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.”

DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006). Claim terms are given their plain and ordinary meaning as would be understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.”

Thorner v. Sony Comput. Entm’t Am. LLC, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

In the Decision on Institution, based on the parties’ arguments, *see* Pet. 14–17; Paper 9, 5–13, and the record at the time, we preliminarily interpreted the following limitations of claims 1 and 9:

Limitation	Interpretation
“simultaneously”	when a user just presses the activation button, both the user identification function and the switching from the inactive state of the display unit to the active state of the display unit are performed, without additional steps
“inactive state”	a state in which the mobile communication terminal is communicable but a display screen is turned off, regardless of whether or not the mobile communication terminal performs a predetermined operation, and the mobile communication terminal is not completely turned off

Limitation	Interpretation
“active state”	a state in which the display screen of the mobile communication terminal is turned on
“user identification unit”	(not a means-plus-function limitation under 35 U.S.C. § 112, sixth paragraph, and no further interpretation is necessary)

Dec. on Inst. 8–17. We specifically “encouraged [the parties] to address” the interpretation of “simultaneously” and “user identification unit” in their papers during trial. *Id.* at 15, 17.

The parties agree with our preliminary interpretations. *See* PO Resp. 5–15; Reply 1–3; Sur-Reply 1–3; Ex. 2001 ¶¶ 80–82 (Dr. Weaver testifying that a person of ordinary skill in the art would understand “user identification unit” to recite sufficiently definite structure and that the term should not be interpreted as a means-plus-function limitation); Ex. 1139 ¶ 15 (Dr. Bederson agreeing with Dr. Weaver’s analysis of “user identification unit”). The parties, however, disagree as to how our preliminary interpretation of “simultaneously” applies to the asserted prior art. *See* PO Resp. 7–10; Reply 1–2; Sur-Reply 1–2. We resolve those issues below. *See infra* Sections II.D.4.b.(1), II.E.3.b.(2). Based on the full record developed during trial, we do not perceive any reason or evidence that compels any deviation from the preliminary interpretations above. We adopt the previous analysis for purposes of this Decision, and conclude that no further claim interpretation is necessary. *See* Dec. on Inst. 8–17; *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy,’

we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (citations omitted)).

C. Legal Standards

A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). The question of obviousness is resolved on the basis of underlying factual determinations, including “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of ordinary skill in the pertinent art.”³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359,

³ Additionally, secondary considerations, such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Graham*, 383 U.S. at 17–18. Patent Owner has not presented any evidence of secondary considerations of nonobviousness in this proceeding.

1367–68 (Fed. Cir. 2016) (citation omitted); *see KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”).

“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (citation omitted). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *accord In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “‘conclusory statements’” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’” (citation omitted)); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

D. Obviousness Ground Based on Fadell, iOS, and Gagneraud

1. Fadell

Fadell describes “an electronic device with an embedded authentication system for restricting access to device resources” including sensors that “detect appropriate biometric information as the user operates

the device, without requiring the user to perform a step for providing the biometric information (e.g., embedding a fingerprint sensor in an input mechanism instead of providing a fingerprint sensor in a separate part of the device housing).” Ex. 1105, Abstract, ¶ 5. Fadell recognizes that previous systems restricting access via passwords or pass codes were “effective only so long as no other user knows the password or pass code,” and fingerprint or retina scan systems, while more secure, were “time consuming and bothersome for the user, requiring an additional step before the user can access the device.” *Id.* ¶ 4. Fadell discloses that “[i]t would be desirable therefore, to provide an electronic device by which biometric and other authentication mechanisms are implemented in the device such that the device authenticates the user quickly and seamlessly, for example as the user turns on, unlocks or wakes the device.” *Id.*

Figure 8B of Fadell is reproduced below.

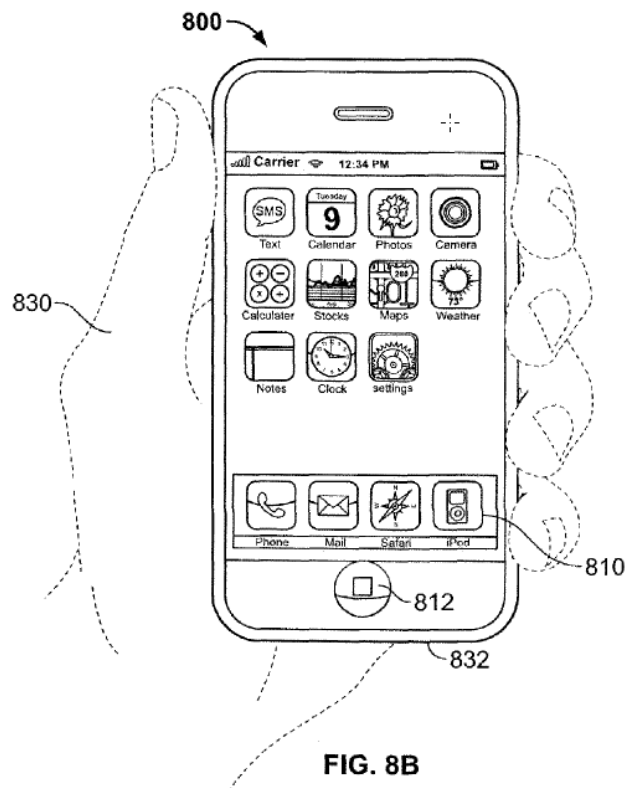


Figure 8B depicts electronic device 800, held in user's hand 830, comprising display 810, home button 812, and sensor 720 "placed behind" home button 812 and "operative to detect features of a user's fingerprint to identify the user." *Id.* ¶¶ 64–67. Sensor 720 can "generate an image or a representation of the skin placed over the sensor that can be compared to a library of images or representations available to the electronic device." *Id.* ¶ 56.

Fadell requires the user to be authenticated (e.g., by fingerprint recognition) before providing access to data and resources on the electronic device. *Id.* ¶¶ 43, 46–48. Figure 15 of Fadell is reproduced below.

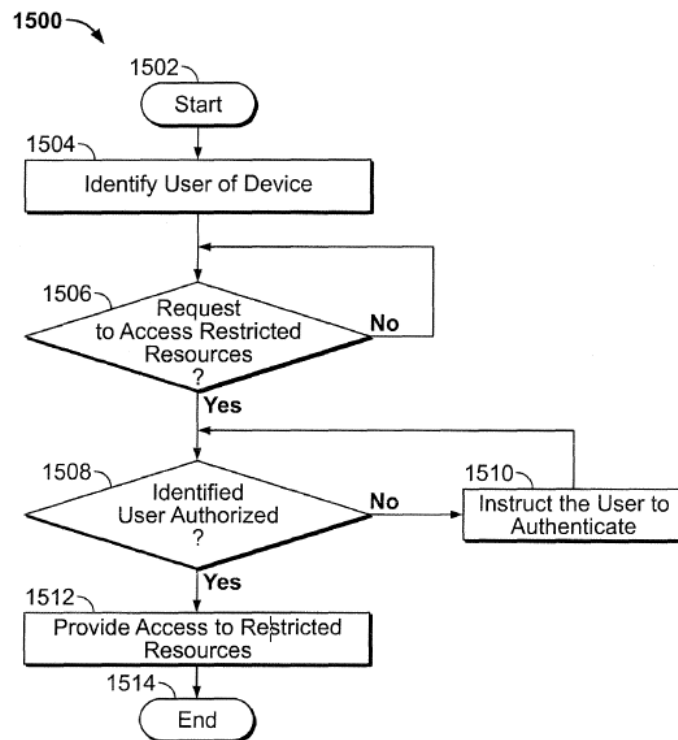


FIG. 15

Figure 15 depicts a flow chart for authenticating a user. *Id.* ¶ 93. At step 1504, the electronic device identifies the user of the device by receiving a username or password or "seamlessly captur[ing] authentication information as the user operates the device" via a fingerprint sensor. *Id.* At step 1506, the electronic device "determine[s] whether a request to access restricted

resources was received.” *Id.* ¶ 94. For example, the request may be to access “data associated with a particular user,” such as a contact list, or a “restricted application,” such as an application restricted to particular users. *Id.* If so, the electronic device “determine[s] whether the identified user is authorized to access the resources” at step 1508. *Id.* ¶ 95. “For example, the electronic device may determine whether the user has provided suitable authentication information for accessing the restricted resources,” or “[t]he electronic device may receive suitable authentication information without the user’s knowledge . . . by embedding an authentication sensor in the device such that authentication information is received during normal use.” *Id.* Once it is determined that the user is authorized to access the requested restricted resource, the electronic device provides access at step 1512. *Id.* ¶ 96.

2. iOS

iOS is a user guide for iPhone OS 3.1 software. Ex. 1107, 1. iOS includes a diagram of an iPhone on page 20, which is reproduced below.

iPhone at a Glance



The reproduced diagram above depicts an iPhone. *Id.* at 20. The iPhone includes a home button that, when pressed, causes the device to display a home screen that includes applications that can be launched. *Id.* at 23. The iPhone also includes a sleep/wake button that allows the user to lock the device or turn it off. *Id.* at 26–27. When the iPhone is locked, nothing happens if the user touches the screen. *Id.* at 26.

3. *Gagneraud*

Gagneraud describes a device comprising a power button, “fingerprint scanner coupled on the power button,” and “authentication application” that “compar[es] a user fingerprint image with a stored fingerprint image.”

Ex. 1106, Abstract. Gagneraud discloses that “[b]y utilizing a fingerprint scanner coupled on a power button, when the fingerprint scanner detects a user, the single act of the fingerprint scanner detecting the user results in the fingerprint scanner beginning to scan and store a user’s fingerprint image while a machine concurrently begins powering on.” *Id.* ¶ 58. “As a result, time is saved and user friendliness is increased by automatically authenticating the user’s fingerprint image with stored fingerprints once the machine has powered on.” *Id.* “Additionally, by configuring a locking mechanism on the machine to unlock after the user fingerprint image has been authenticated, security for the machine and a user’s account is further increased.” *Id.*

Figure 8 of Gagneraud is reproduced below.

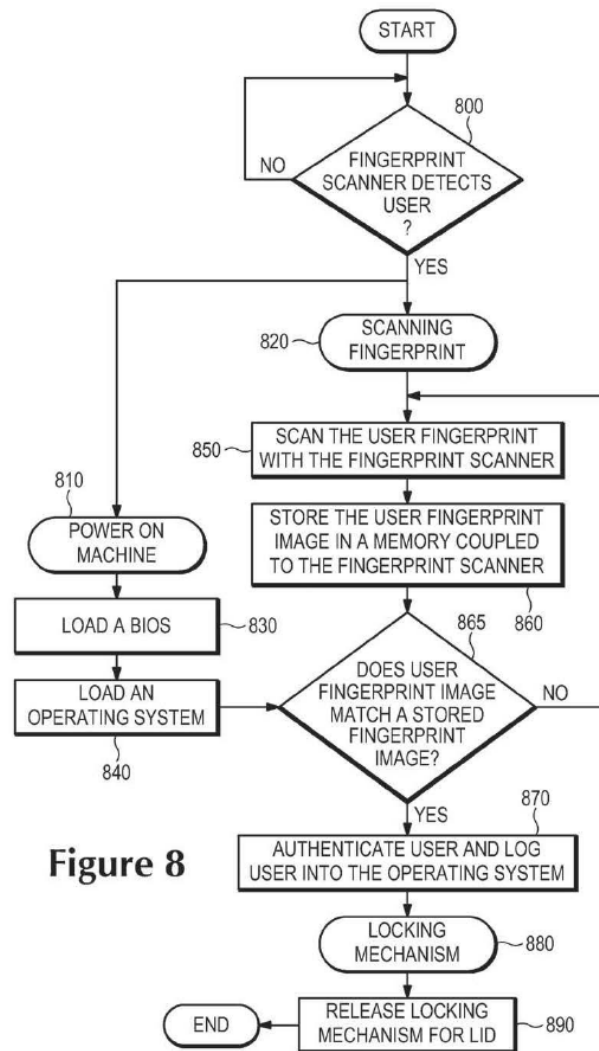


Figure 8

Figure 8 depicts a flow chart for authenticating a user using “a fingerprint scanner on a power button.” *Id.* ¶ 53. The fingerprint scanner detects a user touch at step 800. *Id.* ¶ 54. “Once a user is detected, the machine concurrently begins powering on 810 and scans a user fingerprint with the fingerprint scanner 820.” *Id.* Specifically, “[w]hile the machine is powering on, the fingerprint scanner concurrently scans the user fingerprint with the fingerprint scanner 850 and stores the user fingerprint image in a memory coupled to the fingerprint scanner 860.” *Id.* ¶ 55. “Once the user fingerprint has been stored and the operating system on the machine has been loaded, an

authentication application determines whether the user fingerprint matches a stored fingerprint image or data (stored fingerprints) on the machine 865.” *Id.* If a match is detected, “the operating system will authenticate the user and log the user into the operating system 870,” the authentication application “access[es] a locking mechanism 880,” and “the machine configures [the] locking mechanism on the machine to release and grant the user access to the machine 890.” *Id.* ¶¶ 56–57.

4. *Claim 1*

Petitioner argues that claim 1 is unpatentable over Fadell, iOS,⁴ and Gagneraud under 35 U.S.C. § 103(a), relying on the testimony of Dr. Bederson as support. Pet. 17–38 (citing Ex. 1103). Patent Owner makes various arguments in response, relying on the testimony of Dr. Weaver. PO Resp. 25–40, 50–51 (citing Ex. 2001); Sur-Reply 3–15, 23–24.

a) Undisputed Issues

Petitioner relies on Fadell for the majority of the limitations of claim 1. Pet. 25–38. For example, Petitioner argues that Fadell teaches a “mobile communication terminal” (i.e., electronic device 800) comprising a “display unit” (i.e., display 810), “activation button” (i.e., home button 812),

⁴ Petitioner provides evidence supporting its contention that iOS is a prior art printed publication under 35 U.S.C. § 102(b). *See* Pet. 7 (citing Exs. 1104, 1131). Patent Owner does not assert otherwise in its Response, and we agree that the reference is prior art for the reasons stated by Petitioner. Also, we previously granted Petitioner’s motion to seal certain exhibits pertaining to the alleged printed publication status of iOS. Paper 10 (granting motion to seal portions of Exhibits 1104 and 1131, where Petitioner filed unredacted and redacted versions of each exhibit). We do not refer to any sealed material in this Decision.

and “user identification unit configured to operate a user identification function” including “fingerprint recognition” (i.e., “authentication system 112 for identifying users based on biometric features, controlled by processing circuitry 102” shown in Figure 1 of Fadell). *Id.*

Petitioner relies on a combination of Fadell with iOS for the limitation of claim 1 that the activation button be “configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit.” *Id.* at 27–28. Petitioner contends that Fadell’s electronic device 800 (shown in Figure 8B above) can be an iPhone that would use the operating system described in iOS, given that Fadell is assigned to Apple Inc. and purports to incorporate in its entirety U.S. Provisional Patent Application No. 60/995,200 (Ex. 1128, “the ’200 application”). Pet. 22, 24, 28; *see* Ex. 1105, code (73), ¶ 1. The ’200 application states that “[e]lectronic device 100 may be any suitable electronic device, including for example an iPod or iPhone from Apple, Inc.” Ex. 1128, 5. Petitioner argues that iOS describes an iPhone home button pressed to wake the device from a sleep state. Pet. 28 (citing Ex. 1107, 20, 27, 145). According to Petitioner, iOS shows how a person of ordinary skill in the art would have understood the functionality of Fadell’s iPhone, and even if not directly applicable, a person of ordinary skill in the art would have been motivated to apply the teachings of iOS as a “well-known interface implementation[]” for devices like the one described in Fadell. *Id.* at 24.

Patent Owner does not dispute that Fadell and iOS teach the above limitations of claim 1 or that a person of ordinary skill in the art would have been motivated to combine the references’ teachings in the manner asserted by Petitioner; therefore, any such arguments are waived. *See Novartis AG v.*

Torrent Pharms. Ltd., 853 F.3d 1316, 1330 (Fed. Cir. 2017); *NuVasive*, 842 F.3d at 1380–81; Paper 12, 6 (“Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived.”); Sur-Reply 4 n.1 (Patent Owner stating that it does not address iOS in its Response and Sur-Reply because “it is not relevant to [Patent Owner’s] arguments”). Petitioner’s analysis for each of the limitations, supported by the testimony of Dr. Bederson, which we credit, is persuasive. *See* Pet. 25–30, 38; Ex. 1103 ¶¶ 65–74, 84.

b) Disputed Issues

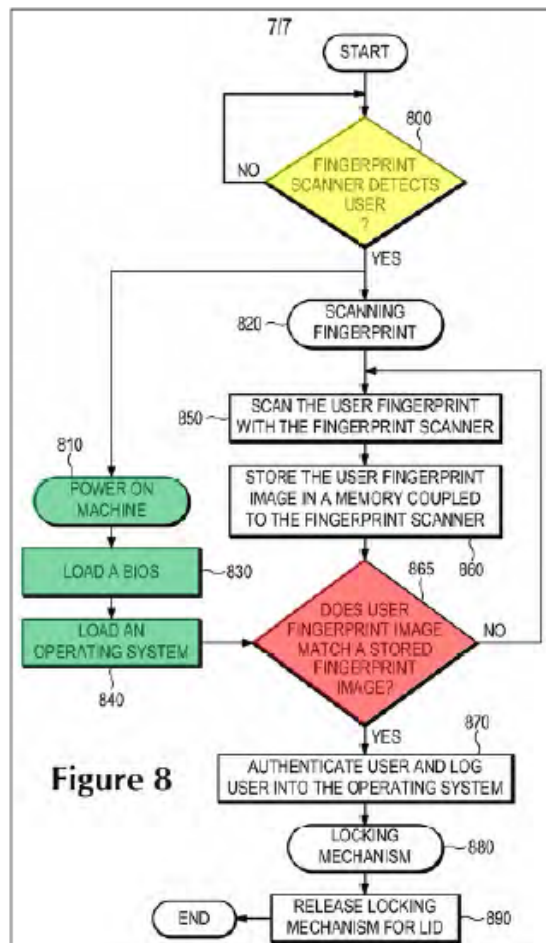
(1) “Simultaneously” Limitation

Claim 1 recites that “the user identification function is performed simultaneously with switching from the inactive state of the display unit to the active state of the display unit by pressing the activation button” (the “simultaneously” limitation). We interpret “simultaneously” to mean that “when a user just presses the activation button, both the user identification function and the switching from the inactive state of the display unit to the active state of the display unit are performed, without additional steps.” *See supra* Section II.B.

As discussed above, Petitioner relies on Fadell as teaching the performance of a “user identification function” (i.e., authenticating the user by fingerprint) and the combination of Fadell and iOS as teaching “switching from the inactive state of the display unit to the active state of the display unit (waking the device) by pressing the activation button (power button or home button).” Pet. 31. Patent Owner does not dispute either of those aspects of the “simultaneously” limitation. *See supra* Section II.D.4.a.

With respect to the remaining requirement that the user identification function be performed “simultaneously” with switching from an inactive state to an active state, Petitioner relies on Fadell and Gagneraud.

Pet. 31–37. Petitioner first argues that Fadell alone teaches simultaneous performance because Fadell’s user identification function is “performed ‘as the user . . . wakes the device’ (i.e., simultaneously—no other steps (user action) are described in Fadell).” *Id.* at 31–32 (quoting Ex. 1105 ¶ 4; citing Ex. 1105, claim 1). However, to the extent Fadell “lacks sufficient detail with respect to whether additional steps (user action) are required to perform the identification function, . . . Gagneraud cures any such deficiencies,” according to Petitioner. *Id.* at 32. Petitioner provides the following annotated version of Figure 8 of Gagneraud (*id.* at 33).



Annotated Figure 8 depicts the steps involved in authenticating the user, highlighting steps 800, 810, 830, 840, and 865 in particular. Petitioner argues that “after the user presses a button with an integrated fingerprint sensor [in step 800 shown in yellow], the machine concurrently powers on (steps 810, 830, 840 in green) and performs fingerprint recognition (step 865 in red).” *Id.* at 33 (citing Ex. 1106 ¶¶ 25–27, 54, 55, 58, Fig. 8). According to Petitioner, “the scanning and recognition of a fingerprint [in Gagneraud] are performed ‘automatically’ and concurrently with powering on of the machine—simultaneously (there are no additional steps (user action) between pressing the activation button and performing either the powering on or fingerprint recognition functions).” *Id.* at 33–34.

(a) Fadell Alone

Patent Owner disputes Petitioner’s assertion that Fadell alone teaches performing the user identification function “simultaneously” with switching from an inactive state to an active state. PO Resp. 26–31 (citing Ex. 2001 ¶¶ 97–101, 103–104); *see* Sur-Reply 4–8. Patent Owner argues that paragraph 4 of Fadell, relied upon by Petitioner, concerns “*where* on the device to place authentication mechanisms to ensure quick and seamless authentication,” not “*when* to perform authentication relative to activating the display.” PO Resp. 26–28. Further, other disclosures in Fadell, such as Figure 15, show that Fadell involves a “sequential, multi-step operation in which authentication occurs *before* the display is turned on, not a simultaneous operation.”⁵ *Id.* at 26–30.

⁵ Petitioner argues that Patent Owner’s use of the term “sequential” in some of its arguments improperly attempts to depart from our preliminary interpretation of the term “simultaneously.” Reply 1–2. We instead

We agree with Patent Owner that Fadell by itself does not teach “simultaneously” performing a user identification function and switching a display unit to an active state. Paragraph 3 of Fadell, in the “Background of the Invention” section, describes known methods for protecting information stored on a portable electronic device, such as requiring entry of a “password or pass code” and “detecting a user’s fingerprint or . . . scanning a user’s retina.” Ex. 1105 ¶ 3. Paragraph 4 then discloses that

[w]hile both of these approaches may be useful, restricting access based on a password or pass code is effective only so long as no other user knows the password or pass code. Once the password or pass code is known, the restriction mechanism may become ineffective. Also, a password or pass code may be forgotten, thus locking an authorized user out of the device. In addition, requiring a user to provide a fingerprint or submit to a retina scan may be time consuming and bothersome for the user, requiring an additional step before the user can access the device. While this approach is more secure than entering a password or pass code, it comes at a cost in hardware (e.g., the necessary scanner, detector, or reader) and time. *It would be desirable therefore, to provide an electronic device by which biometric and other authentication mechanisms are implemented in the device such that the device authenticates the user quickly and seamlessly, for example as the user turns on, unlocks or wakes the device.*

Id. ¶ 4 (emphasis added). Petitioner primarily relies on the statement in the final sentence of paragraph 4 that the device authenticates the user “as the user . . . wakes the device.” Pet. 31. Fadell, however, never uses the term

consider Patent Owner’s arguments as attempts to distinguish prior art processes involving multiple steps from processes that would be performed “simultaneously” (i.e., performance of both recited functions without additional steps). *See* PO Resp. 26–27; Sur-Reply 1–2 (arguing that Fadell does not teach the “simultaneously” limitation because it “disclose[s] performing the user identification function and switching the display unit from the inactive state to the active state *in sequence (i.e., step-wise)*”).

“wakes” other than in paragraph 4, does not explain what is meant by the term, and does not describe any particular embodiment in which a user is authenticated as the user “wakes” the device or how such functionality would be implemented. Petitioner also points to claim 1 of Fadell, which recites the steps of “receiving an input from a user,” “detecting identification information of the user as the input is received,” and “authenticating the user based on the detected information,” but does not recite any action apart from the user identification and authentication (e.g., switching a display screen to an active state) and thus, does not describe the relationship between such events (i.e., with or without additional steps). *See id.* at 31–32.

Fadell discloses a specific sequence of steps that take place when authenticating a user in the context of Figure 15. The authentication process shown in Figure 15 involves first identifying the user (e.g., by receiving a username or password or “seamlessly captur[ing] authentication information as the user operates the device” via a fingerprint sensor) (step 1504), receiving from the user “a request to access restricted resources” (step 1506), performing user authentication (step 1508), and then, only if a determination is made that the user is authenticated, providing access to the restricted “resources” that the user requested (step 1512). Ex. 1105

¶¶ 93–96. In other words, user authentication is not performed “simultaneously” with providing access to restricted “resources” because there are additional steps between the two events.⁶

⁶ Fadell’s process of providing access to a “resource” only on the condition that the user is authenticated is similar to that of U.S. Patent Application Publication No. 2013/0057385 A1 (Ex. 1142, “Murakami”), addressed during prosecution of the ’557 patent. *See* Dec. on Inst. 12–13; Ex. 1102, 190–191 (applicants arguing that Murakami does not teach the “simultaneously” limitation because “the displaying of the data

The parties dispute the import of Figure 15. Patent Owner argues that it is relevant because it is the only description in Fadell of the sequence of steps involved in authenticating a user, and argues that Fadell uses the term “resource” expansively, such that the display screen of the device can be a restricted “resource.” PO Resp. 28–30 (citing Ex. 1105 ¶¶ 24, 41, 42, 46; Ex. 2001 ¶¶ 100–101, 103). Petitioner argues that nothing in Fadell explicitly discloses that the display screen is a restricted “resource,” Figure 15 is only one embodiment in Fadell and contrary to another embodiment shown in Figure 4 where “the display presents authentication instructions,” and even if it were proper to look to Figure 15, paragraph 4 of Fadell describes the claimed simultaneous performance by itself. Reply 8–10 (citing Ex. 1105 ¶¶ 24, 93–96; Ex. 1139 ¶¶ 29–33).

Based on our review of the full trial record, we agree with Patent Owner. As an initial matter, we do not see anything in Fadell indicating that the display screen cannot be a “resource” to which the user requests access. Fadell discloses that user authentication “may or may not” be required to access the display screen, suggesting that the display screen may constitute a restricted “resource” in at least some circumstances (in which case the multi-step process of Figure 15 would apply). Ex. 1105 ¶ 42. The question is whether a person of ordinary skill in the art would have understood the authentication process of Figure 15 to apply in the context of a user requesting access to the display screen to wake from a state where the

[in Murakami] is performed *on the condition* that [the] user’s identity is authenticated” (i.e., after the user identification function completes the step of authenticating the user), rather than the user identification function and switching from the inactive state to the active state being performed without additional steps (emphasis added)).

display screen is turned off. Petitioner is correct that Figure 15 is just one embodiment among others described in Fadell, but, importantly, it is the *only* description in Fadell of the sequence of steps of authenticating the user relative to performing some other action. Fadell uses the term “wakes” in paragraph 4, but never describes an embodiment in which user authentication is performed relative to waking the device. Thus, there is no explicit disclosure of whether the display screen would be a restricted “resource” in the context of waking the device as described in paragraph 4—the *only* relevant disclosure is the Figure 15 embodiment, which is a process that is performed with additional steps.

Further, although the description of Figure 15 lists two examples of restricted “data” and “application[s],” other portions of the reference describe other examples of restricted “resources,” such as “files” and “personal settings,” and use the term “resource” more broadly. *See id.* ¶¶ 24 (“Access to any suitable electronic device resource may be restricted . . .”), 41 (“The electronic device may require authorization prior to providing access to any electronic device resource.”), 46, 93–96. Indeed, Dr. Bederson acknowledged that “resource” is used broadly in Fadell and that the display screen can be a “resource,” testifying as follows:

Q. What is a device resource?

[PETITIONER’S COUNSEL]: Objection; form.

A. I think the way that Fadell describes restricting access to device resources, this is in the context of restricting a user to access a device’s resources. So I think it would be some resource on the device that a user could use.

. . .

Q. Is the display screen a resource?

A. Well, as I just said, if the device is asleep, I think that the screen would be off and not available for use, but I think that would be consistent at least with the way that this reference is describing restricting access to device resources.

Ex. 2007, 20:21–21:2, 22:15–21; *see* Reply 10 (acknowledging that Dr. Bederson “confirmed that a display generally can be a resource”); Tr. 15:8–9, 15:19–20 (same).

Finally, we are not persuaded by Petitioner’s reference to Figure 4 of Fadell. *See* Reply 9. Figure 4 depicts display screen 400 including selectable option 410 for “unlocking the display” to access “the home screen from which information and applications are launched.” *See* Ex. 1105 ¶¶ 46–48, Fig. 4. Because the figure pertains to unlocking the device (when the device is awake and the display screen is already turned on), rather than waking the device from a state where the display screen is turned off, it does not correspond to the disclosure of waking in paragraph 4 that Petitioner relies upon in the Petition. *See id.* ¶ 4 (listing three categories where the user “turns on,” “unlocks,” or “wakes” the device). We agree with Patent Owner that “[j]ust because the display is not a restricted resource in one embodiment does not mean that the display can *never* be a restricted resource.” *See* Sur-Reply 8 & n.2.

We find that the isolated reference to authenticating the user as the user “wakes” the device in paragraph 4 of Fadell is too ambiguous and counter to the remainder of the reference to constitute by itself a teaching of performing user identification “simultaneously” with switching to an active state. *See* Ex. 1105 ¶ 4. As Patent Owner acknowledges, it merely expresses a *goal* of quick and seamless user authentication “as the user turns

on, unlocks or wakes the device,” but does not teach the claim limitation alone. *See id.*; PO Resp. 31.

(b) Combination With Gagneraud

We turn now to Petitioner’s alternative argument that the combination of Fadell and Gagneraud teaches performing user identification “simultaneously” with switching to an active state. Petitioner argues that because “Fadell discloses the goal of simultaneous operations but may not disclose how the timing of the simultaneous operations would be related to each other and to other possible user actions, a [person of ordinary skill in the art] would have looked to analogous systems, like Gagneraud, for exemplary implementations.” Pet. 34. In the proposed combination, Petitioner relies on Fadell (understood in view of iOS) for its teachings of authentication via fingerprint recognition and the goal of authenticating a user as the user “wakes” the device using an activation button, and relies on Gagneraud for its teaching of simultaneous operations, namely performing both fingerprint recognition and powering on of the device based on a button press by the user, without additional steps. *Id.* at 27–34. According to Petitioner, a person of ordinary skill in the art would have applied “Gagneraud’s teachings of simultaneous performance to Fadell’s wake and authentication procedures” in such a manner that user authentication in the combined device would be performed simultaneously with waking the device (i.e., activating the display). *Id.* at 34–37.

Patent Owner responds that “Gagneraud does not cure Fadell’s deficiencies” because Gagneraud discloses “performing an authentication function while the *entire device* (except the fingerprint scanner itself) is being powered on,” not simultaneously performing user authentication and

activating a display when the device is already on. PO Resp. 31–32 (citing Ex. 1106 ¶ 15, Figs. 6, 8; Ex. 2001 ¶ 105); *see* Sur-Reply 8–12. Patent Owner argues that “[w]hen a limitation is more than a ‘peripheral issue,’ it ‘requires a core factual finding,’ which in turn requires ‘point[ing] to some concrete evidence in the record in support of these findings,’” and “[n]either Fadell nor Gagneraud discloses performing fingerprint authentication simultaneously with activating the display (as opposed to turning on the device).” PO Resp. 32–34 (quoting *K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014); citing Ex. 2001 ¶ 106).

Patent Owner’s arguments are unpersuasive, as they are directed to Gagneraud individually rather than the combination of Fadell and Gagneraud proposed by Petitioner. *See Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1050 (Fed. Cir. 2019) (“A finding of obviousness . . . cannot be overcome ‘by attacking references individually where the rejection is based upon the teachings of a combination of references.’” (quoting *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986)); *In re Mouttet*, 686 F.3d 1322, 1332–33 (Fed. Cir. 2012) (holding that “the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art”). Patent Owner is correct that Gagneraud alone teaches performing user authentication simultaneously with powering on the device, rather than with switching the device’s display from an inactive state to an active state. *See* PO Resp. 31–32. But Petitioner relies on Fadell (understood in view of iOS), not Gagneraud, as teaching the recited state switching. Pet. 27–32, 34. Petitioner’s position is that Gagneraud’s teachings regarding simultaneous performance would apply equally to other contexts where a user is indicating his or her “initial interaction” with a device and, therefore, applying Gagneraud’s teachings to

Fadell and iOS would have resulted in a device that performed user authentication and activating the display simultaneously, i.e., without additional steps. *Id.* at 34–37.

We agree with Petitioner that Fadell, iOS, and Gagneraud in combination teach the “simultaneously” limitation. Petitioner points to specific language in the references and explains how a person of ordinary skill in the art would have viewed their teachings in combination. Fadell teaches an “activation button” (i.e., home button 812) that, when pressed, causes the electronic device to perform a “user identification function” (i.e., identifying the user by fingerprint). *See* Ex. 1105 ¶¶ 56, 64–65; Pet. 19–20, 27–31. Fadell’s device is an iPhone, and iOS teaches that pressing the iPhone home button causes the device to switch from an “inactive state” where the device’s display screen is turned off but the device is not completely turned off to an “active state” where the display screen is turned on (i.e., the device wakes from a sleep state). *See* Ex. 1107, 20, 27, 145; Pet. 22–24, 28. Gagneraud expressly teaches performance of a user identification function (i.e., fingerprint recognition) (step 865 shown in red in annotated Figure 8 above) and powering on of the device (steps 810, 830, and 840 shown in green) “simultaneously,” i.e., without additional steps. *See* Ex. 1106 ¶¶ 25 (fingerprint recognition is performed “while the machine 100 is powering on” instead of “after the machine 100 is powering on”), 54 (“Once a user is detected, the machine *concurrently* begins powering on 810 and scans a user fingerprint” (emphasis added)), 55, 58 (“By utilizing a fingerprint scanner coupled on a power button, when the fingerprint scanner detects a user, the single act of the fingerprint scanner detecting the user results in the fingerprint scanner beginning to scan and store a user’s fingerprint image while a machine *concurrently* begins powering on.”

(emphasis added)); Pet. 20–21, 32–34; PO Resp. 36 (acknowledging that “Gagneraud discloses a simultaneous process as the device powers on”).

Thus, applying Gagneraud’s teaching of user identification with respect to powering on of the device to the very similar teaching of Fadell of user identification with respect to waking from a sleep state results in the full “simultaneously” limitation. *See* Pet. 34–37. We credit the supporting testimony of Dr. Bederson on these points, as it is based on and consistent with the specific disclosures of the references discussed above. *See* Ex. 1103 ¶¶ 53–64, 70–80.

Indeed, Patent Owner acknowledges that the references separately teach various aspects of the “simultaneously” limitation, stating that “Fadell discloses a sensor embedded in the device [for fingerprint recognition] that performs a sequential process when the device is already on” and “Gagneraud discloses a simultaneous process as the device powers on,” but disputes whether the references in combination teach the full limitation. PO Resp. 36. The issue then is whether a person of ordinary skill in the art would have been motivated to combine the references’ teachings to create a device that performed user authentication and activating the display simultaneously, and we address the parties’ arguments on that point below. *See infra* Section II.D.4.b.(2).

We find that the combination of Fadell, iOS, and Gagneraud teaches the limitation of claim 1 that “the user identification function is performed simultaneously with switching from the inactive state of the display unit to the active state of the display unit by pressing the activation button.”

(2) Motivation to Combine With Gagneraud

Petitioner argues that a person of ordinary skill in the art would have been able and motivated to modify Fadell’s electronic device based on the teachings of Gagneraud. Pet. 34–37. Specifically, Petitioner asserts that a person of ordinary skill in the art would have applied “Gagneraud’s teachings of simultaneous performance to Fadell’s wake and authentication procedures” such that user authentication would be performed simultaneously with waking the device (i.e., activating the display). *Id.* at 34–37.

According to Petitioner, an ordinarily skilled artisan would have been motivated to do so “to fulfill Fadell’s goal of ‘authentica[t]ing the user quickly and seamlessly . . . as the user . . . wakes the device’ . . . with the benefit of saving time and simplifying user interaction.” *Id.* at 34 (emphasis omitted) (quoting Ex. 1105 ¶ 4; citing Ex. 1106 ¶ 58). Doing so “would have been no more than the application of known methods and devices (Gagneraud’s disclosed timing) to improve similar methods and devices (Fadell’s device with fingerprint recognition) in the same way (by implementing concurrent operations to save time with a single step/user action)” in Petitioner’s view. *Id.* Petitioner further explains that

a [person of ordinary skill in the art] would have known that the disclosures and teachings of Fadell and Gagneraud would have had wide applicability in the art of electronic devices. This is because their teachings relate to fundamental human-computer interaction concepts such as (1) determining that a user is indicating their initial interaction with a device, and (2) determining whether that user should be allowed to interact with the device. In other words, Gagneraud teaches that a fingerprint function should be performed simultaneously with powering-on a device in order to save time. But whether the device is “powering” on (as in Gagneraud and Fadell) or

“waking” from sleep (also in Fadell), or whether the user signals activation via a power button or home button, has no bearing on the underlying question of whether the user is indicating their initial interaction with the device. A [person of ordinary skill in the art] would have understood that the concept of fingerprint identification would have been needed for, and applicable to, any process in which the device has not been in active use (among other situations) and a user signals that they are initiating interactions with some function of the device. Fadell makes this equivalence explicit in saying that authentication mechanisms are used for the group of functions: “as the user turns on, unlocks or wakes the device.” Any button that would have been used to wake a device—i.e., the first button being pressed by the user—would have been an obvious candidate for the convenience factor desired in Fadell and Gagneraud.

Id. at 35–36 (citations and emphases omitted).

Finally, Petitioner argues that a person of ordinary skill in the art would have had a reasonable expectation of success in modifying Fadell as explained above because, for example, doing so would have utilized “existing hardware and software” and a person of ordinary skill in the art “would have only needed to identify the button press and link its activation to particular functions,” which was a “simple input configuration.” *Id.* at 37–38. Dr. Bederson provides supporting testimony for Petitioner’s contentions. *See* Ex. 1103 ¶¶ 32–41, 75–83.

Patent Owner makes five arguments in response. First, Patent Owner argues that Petitioner and Dr. Bederson do not explain sufficiently why “determining that a user is indicating their initial interaction with a device” (e.g., waking from a sleep state as in Fadell, powering on as in Gagneraud) constitutes a “fundamental human-computer interaction concept[.]” PO Resp. 34–35 (citing Ex. 2001 ¶¶ 107–108); *see* Sur-Reply 11–14.

Dr. Weaver states that he is “not aware of any literature” stating that to be the case. Ex. 2001 ¶ 108.

We find that the similarity between the references’ teachings regarding initial interaction with a device is some evidence of whether a person of ordinary skill in the art would have thought to combine them. Petitioner’s position is that an ordinarily skilled artisan “would have understood that the concept of fingerprint identification would have been needed for, and applicable to, any process in which the device has not been in active use (among other situations) and a user signals that they are initiating interaction with some function of the device.” Pet. 35–36. That assertion is supported by paragraph 4 of Fadell, which expresses a desire for quick and seamless user authentication in three contexts: when the user “turns on,” “unlocks,” and “wakes” the device. *See* Ex. 1105 ¶ 4. Thus, waking from a sleep state (as in Fadell) and powering on a device (as in Gagneraud) are analogous initial interaction situations at least by virtue of the fact that Fadell refers to them together. *See* Pet. 36 (arguing that “Fadell makes [the] equivalence explicit”); Ex. 1139 ¶ 35. In addition, the record demonstrates that issues pertaining to whether a user is granted access to a device when he or she indicates a desire to access it were well-known in the art. *See* Ex. 1105 ¶¶ 3–4; Ex. 1139 ¶ 37; Ex. 1140, 2 (“The problem of how users authenticate to systems, particularly using passwords, is one of the oldest and most heavily studied topics in usable security.”).

The similarity between the references’ teachings regarding initial interaction with a device, though, is only one aspect of Petitioner’s motivation to combine analysis. More important is the *express* motivation to combine in Fadell and clear link between the references’ teachings. *See* Pet. 34–35; Reply 10–11. Fadell states that requiring a user to use a

fingerprint or retina scan to gain access to a portable electronic device can be “time consuming and bothersome for the user” because it requires an “additional step” before allowing the user to access the device and also requires additional “hardware” in the device. Ex. 1105 ¶ 4. Therefore, according to Fadell, “[i]t would be desirable . . . to provide an electronic device by which biometric and other authentication mechanisms are implemented in the device such that the device *authenticates the user quickly and seamlessly*, for example as the user turns on, unlocks or *wakes* the device.” *Id.* (emphases added).

We find this to be the most probative evidence of why a person of ordinary skill in the art would have thought to combine Fadell and Gagneraud. As both parties agree, Fadell expresses a *goal* of quick and seamless user authentication “as the user turns on, unlocks or wakes the device.” *See* Pet. 34; PO Resp. 31; Tr. 8:10–13. Fadell achieves quick and seamless user authentication by integrating a fingerprint sensor into the device itself (e.g., behind the home button). Ex. 1105 ¶¶ 5, 64–67, Fig. 8B. But Gagneraud takes that a step further by, in addition to integrating a fingerprint scanner with a button on the device, “concurrently” (i.e., simultaneously) performing user authentication and powering on of the device. *See* Ex. 1106 ¶ 58. Gagneraud, therefore, “*adds to* Fadell’s disclosure by providing examples of specific timings and non-conditional processes that a [person of ordinary skill in the art] would have been motivated to apply in order to fulfill Fadell’s goal.” *See* Reply 12 (emphasis added). In other words, by performing actions simultaneously, Gagneraud helps to eliminate an “additional step” consistent with Fadell’s stated objective. Importantly, Gagneraud expressly states that doing so has the *benefit* that “time is saved and user friendliness is increased,” mirroring

Fadell's language that user authentication should be quick and seamless and helping to alleviate Fadell's identified problem where prior art methods were "time consuming and bothersome" for the user because they required an "additional step." *See* Ex. 1105 ¶¶ 3–4; Ex. 1106 ¶ 58.

Patent Owner responds that Fadell's description in paragraph 4 does not support a motivation to combine because it is focused on "quickly and seamlessly" authenticating a user via integration of the sensor into the device, not changing any timing with respect to user authentication, and Fadell "never indicates that it is concerned with exactly *when* authentication occurs relative to activating a display." Sur-Reply 12–13. We disagree. Fadell states that it is desirable to perform the user authentication process "quickly," suggesting a concern with timing, and Gagneraud provides a way to do that with an express benefit. *See* Ex. 1105 ¶ 4; Ex. 1106 ¶ 58; Tr. 29:23–30:5 (Patent Owner acknowledging that "what Fadell is trying to do is to save time"), 37:9–21 (Patent Owner acknowledging that the use of the term "quickly" "implies a time-savings concern"). Dr. Bederson's explanation of this connection between the references' goals and solutions is consistent with the references' teachings and particularly persuasive. *See, e.g.,* Ex. 1103 ¶¶ 81–82; Ex. 1139 ¶¶ 36–37. We find that, in addition to the similarity of the teachings of Fadell and Gagneraud as both pertaining to determining a user's initial interaction with a device, the references themselves demonstrate that a person of ordinary skill in the art would have been led to implement Gagneraud's simultaneous performance in waking the device of Fadell. *See Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000) (evidence of a motivation to combine prior art references "may flow from the prior art references themselves").

Second, Patent Owner contends that a person of ordinary skill in the art would not have combined Fadell and Gagneraud because they teach authenticating a user in different ways—with a multi-step process in Fadell and a simultaneous process in Gagneraud—and “[w]hen two references already accomplish similar functions by different means, one of skill in the art would not be motivated to combine them.” PO Resp. 36 (citing Ex. 2001 ¶ 109; *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1369 (Fed. Cir. 2012)); see Sur-Reply 14. As explained above, however, Gagneraud does not merely teach another method of user authentication. Rather, we find that a person of ordinary skill in the art would have understood Gagneraud’s teachings regarding simultaneous performance as adding to and helping to fulfill Fadell’s stated goal, which supports Petitioner’s position that a person of ordinary skill in the art would have been motivated to combine their teachings. The similarity between the references’ disclosures regarding initial interaction with a device also suggests their compatibility. See *In re Hyon*, 679 F.3d 1363, 1366 (Fed. Cir. 2012) (affirming an obviousness determination where two “references both teach processes directed to making the same class of products” and minor differences between the disclosures did not “negate the motivation to combine”). *Kinetic Concepts* is distinguishable because, in that case, the patent challenger “never offered evidence articulating why a person having ordinary skill in the art would combine the primary references to obtain the disclosed inventions” and there was “significant evidence of teaching away,” whereas Petitioner here provided ample reasoning and there is no evidence of teaching away. See 688 F.3d at 1368–69.

Third, Patent Owner argues that a person of ordinary skill in the art would not have combined Gagneraud with Fadell because doing so would

change the “fundamental operation” of Fadell. PO Resp. 37–38 (citing Ex. 2001 ¶¶ 110–111); *see* Sur-Reply 14–15. According to Patent Owner, Fadell’s fundamental principle of operation is to “require[] authentication *before* access to a restricted resource, such as the display, is allowed,” whereas Gagneraud’s “device powers on regardless of the authentication result,” such that modifying Fadell’s device based on Gagneraud would result in Fadell activating the display screen prior to authenticating the user, “undermining Fadell’s principle of operation.” PO Resp. 37.

We disagree with Patent Owner’s characterization of Fadell. As explained above, the focus of Fadell is on the integration of a biometric sensor into the portable electronic device itself so that the user provides authentication information without performing an express input. That feature is described prominently and at length in the Abstract and “Background of the Invention,” “Summary of the Invention,” and “Detailed Description” sections of Fadell. *See, e.g.*, Ex. 1105, code (54) (“*Embedded Authentication Systems in an Electronic Device*” (emphasis added)), code (57) (“This invention is directed to an electronic device with an *embedded* authentication system for restricting access to device resources.” (emphasis added)), ¶¶ 2 (“This invention is directed to electronic devices with *embedded* authentication systems.” (emphasis added)), 4–5, 39, 60–70, 95, Fig. 8B; PO Resp. 27–28 (Patent Owner arguing that “the bulk of Fadell’s disclosure is about *where* to place the sensor and *how* to perform authentication”); Ex. 2001 ¶¶ 98–99; Tr. 28:11–14 (Patent Owner arguing that Fadell is “all about the embedded nature of the sensor within the device”), 31:1–4 (Patent Owner arguing that Fadell is “all about . . . the final incorporation of the sensor within the device”). Embedding the sensor is not merely the solution of Fadell; it relates to how the device of Fadell operates

in practice—it is what allows Fadell, in operation, to seamlessly authenticate the user. *See* Ex. 1105 ¶¶ 4, 64 (“To provide a seamless user experience, the sensors 720 may be embedded in or under at least one of input mechanism 710 and 712.”), 93 (“The electronic device may automatically receive authentication information without requiring an express input from the user, for example by placing a sensor of the authentication system in a manner that seamlessly captures authentication information as the user operates the device.”), 95. We are not persuaded that Fadell’s discussion of timing in reference to Figure 15 should be considered the reference’s fundamental principle of operation. *See* Ex. 2001 ¶ 85 (Dr. Weaver acknowledging that “Fadell says little about the timing of authentication relative to turning on the display” and “[t]he only disclosure of timing is depicted in Figure 15”); PO Resp. 28 (“The only substantive disclosure in Fadell related to timing of authentication is Figure 15.”). Based on the full record developed during trial, we find that modifying the Fadell device to perform user authentication and activate the display simultaneously would not change Fadell’s principle of operation or render the device unsuitable for its intended purpose.

Fourth, Patent Owner argues that “power management considerations would dissuade a [person of ordinary skill in the art] from combining Fadell with Gagneraud.” PO Resp. 38–40; *see* Ex. 2001 ¶¶ 112–118 (citing Exs. 2002–2005 as support). According to Patent Owner, Gagneraud’s fingerprint scanner “always receives power—even when the device itself is off,” allowing user authentication “while the device is powering on.” PO Resp. 38. Gagneraud further discloses larger devices like laptop computers, whereas Fadell is directed to portable electronic devices like cellular telephones that have small batteries and short battery life, making power management an “important concern.” *Id.* at 39–40 (citing Ex. 1103

¶ 31 (Dr. Bederson testifying that “[s]ince portable mobile computing and communication devices were first introduced, power management was a prime concern”). Patent Owner contends that “at the time of the invention, fingerprint scanners could be large power draws, draining a battery quickly,” so a person of ordinary skill in the art would not have been motivated to modify Fadell based on Gagneraud’s process (where the fingerprint scanner always receives power) because doing so “would quickly drain an already-small battery.” *Id.* at 40.

To the extent Patent Owner’s arguments are premised on incorporating certain aspects of Gagneraud’s fingerprint scanner or power usage of that particular scanner, they are not persuasive. In the proposed combination, Petitioner relies on Gagneraud only for a teaching of the timing of actions being performed relative to each other, namely user authentication being performed “simultaneously” (i.e., without additional steps) with powering on the device (i.e., a user indicating an initial interaction with the device by pressing a button to turn the device on). “It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements. . . . Rather, the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art.” *Mouttet*, 686 F.3d at 1332–33; *see also MCM Portfolio LLC v. Hewlett-Packard Co.*, 812 F.3d 1284, 1294 (Fed. Cir. 2015) (“[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference” (citation omitted)).

Nor are we persuaded based on the evidence of record that power management issues would have been such a concern as to discourage an

ordinarily skilled artisan from combining Fadell and Gagneraud. Gagneraud never states that its fingerprint scanner consumes a large amount of power. In addition, Gagneraud does not actually perform scanning until the user presses the power button (at which time “the machine concurrently begins powering on”). *See* Ex. 1106, Fig. 8 (steps 800, 810, and 820), ¶¶ 54–55, 58. We agree with Dr. Bederson that a person of ordinary skill in the art would have understood this disclosure to mean that “prior to detecting a user and scanning the fingerprint, the fingerprint scanner consumes less power,” and power consumed by the fingerprint scanner would have been at a “manageable” level. *See* Ex. 1139 ¶ 44. Evidence in the record also suggests that lower power fingerprint sensors for portable electronic devices were known at the time of the ’557 patent. *See* Reply 15–17; Ex. 1141, 1 (describing a “lower power consumption” fingerprint sensor); Ex. 2004 ¶ 57 (describing how power consumption can be managed with other considerations, such as, for example, “low power” sensors being used “if battery power is low”); *see also* Ex. 1103 ¶ 32 (testifying that prior to the ’557 patent, “designers of mobile computers and phones of course also tried to have the computer go to some kind of low power ‘sleep’ or ‘standby’ mode whenever the device was not being used”). And Fadell broadly states that its authentication system can use “any suitable type of sensor” for detecting the user’s fingerprint. Ex. 1105 ¶¶ 55, 69.

Fifth, Patent Owner argues that Petitioner’s asserted grounds fail because “Petitioner has not identified any prior art reference that discloses an *activation button* that both activates the display and simultaneously causes the performance of fingerprint recognition (or any user identification function).” PO Resp. 50–51 (citing Ex. 2001 ¶¶ 132–133); *see* Sur-Reply 23–24. According to Patent Owner, each reference at most “discloses *only*

(1) a button that activates the display, or (2) a device on/off switch that also causes the performance of fingerprint recognition,” but no single reference “discloses an *activation button* that *simultaneously* performs *both* functions,” as required by the claims. PO Resp. 51. Patent Owner is correct that no single reference discloses the claim limitations at issue, but Petitioner’s obviousness theory is premised on the *combination* of Fadell, iOS, and Gagneraud.

Petitioner has provided sufficient reasoning for why a person of ordinary skill in the art would have been motivated to combine the teachings of the references in the manner asserted and would have had a reasonable expectation of success in doing so.

c) Conclusion

For the reasons set forth by Petitioner and explained above, we are persuaded that Fadell, iOS, and Gagneraud collectively teach all of the limitations of claim 1, and that a person of ordinary skill in the art would have been motivated to combine the references’ teachings to achieve the mobile communication terminal recited in the claim and would have had a reasonable expectation of success in doing so. Petitioner has proven, by a preponderance of the evidence, that claim 1 would have been obvious based on Fadell, iOS, and Gagneraud under 35 U.S.C. § 103(a).

5. Claims 8, 9, and 15

Independent claim 9 is a method claim with limitations very similar to those of apparatus claim 1. Largely referring to its analysis of claim 1, Petitioner explains how the limitations of claim 9 are taught by the combination of Fadell, iOS, and Gagneraud, with supporting testimony from

Dr. Bederson. *See* Pet. 17–39; Ex. 1103 ¶¶ 52–84, 87–89. Claims 8 and 15 depend from claims 1 and 9, respectively, and recite “comparing a fingerprint acquired by the activation button to pre-stored fingerprint information of a user.” Petitioner argues that Fadell teaches using “a sensor embedded in a button or any suitable location to sense features of a user’s skin and compare the sensed features to pre-stored identification information.” Pet. 38–39 (citing Ex. 1105 ¶¶ 5, 55, 56, 61, 65; Ex. 1103 ¶¶ 85–86, 90). Patent Owner argues independent claims 1 and 9 together in its Response and Sur-Reply, and does not argue separately dependent claims 8 and 15. *See* PO Resp. 25–40, 50–51; Sur-Reply 3–15, 23–24.

We disagree with Patent Owner’s arguments for the reasons explained above. *See supra* Section II.D.4.b. We have reviewed Petitioner’s contentions and supporting evidence, including the testimony of Dr. Bederson, and are persuaded that Petitioner has proven, by a preponderance of the evidence, that claims 8, 9, and 15 would have been obvious based on Fadell, iOS, and Gagneraud under 35 U.S.C. § 103(a), for the reasons stated by Petitioner.

E. Obviousness Ground Based on Goertz and Herfet

1. Goertz

Goertz describes a mobile device having a home button and a touch screen user interface. Ex. 1113 ¶¶ 2, 8, 59.

Figures 9, 10, and 11 of Goertz, depicting turning the device on and off, are reproduced below.

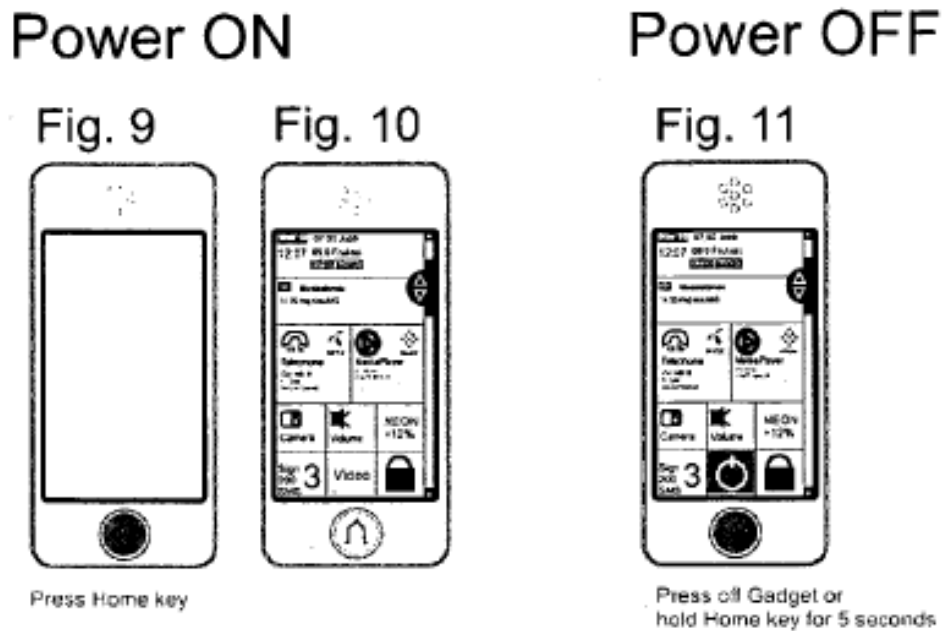
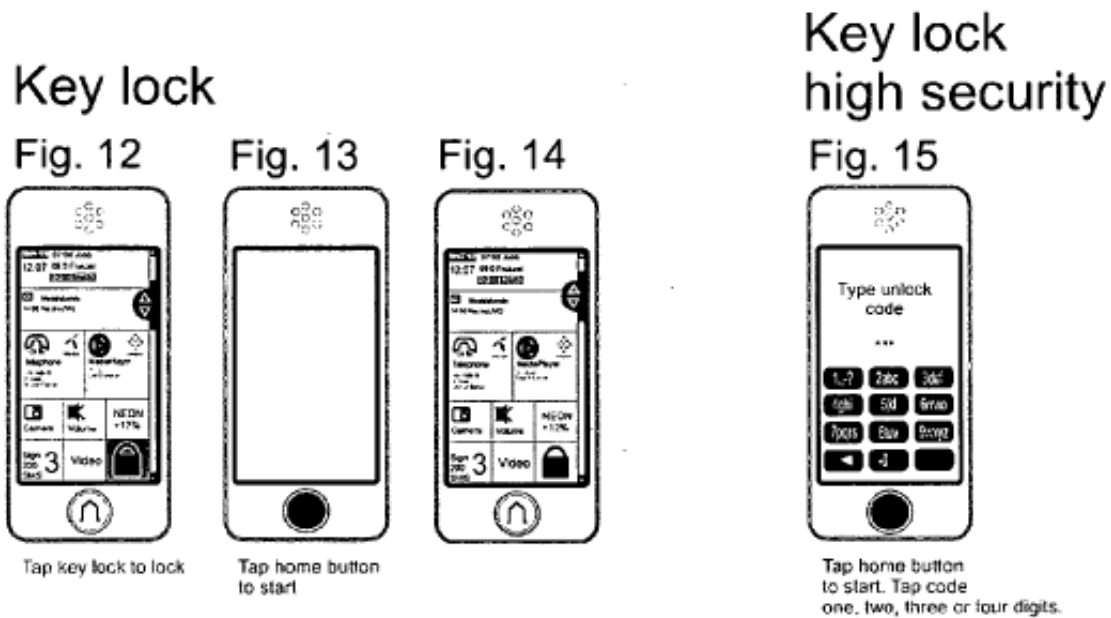


Figure 9 displays a first phone with “a blank screen, indicating that power is off.” *Id.* ¶ 59. Figure 10 displays a second phone with “gadgets displayed thereon, indicating that power is on.” *Id.* A “home key” is displayed at the bottom of the phones and can be activated, such as by touching the home key, in order to turn the power on. *Id.* Figure 11 depicts a phone that is turned on and indicates that touching the home key for an extended period of time (e.g., five seconds) causes the phone to power off. *Id.*

Figures 12, 13, 14, and 15 of Goertz illustrate the locking and unlocking of the device, and are reproduced below.



In Figure 12, “a lock gadget is displayed in the lower right corner of the screen” that, when pressed, locks the phone and restricts its access in some manner. *Id.* ¶ 60. Figure 13 shows a locked phone, in which the user can “activate[] the home key, located at the bottom center of the device,” to unlock the phone. *Id.* Figure 14 “shows the phone after it has been unlocked; gadgets are now displayed on screen and are activated in response to user input.” *Id.* Figure 15 shows a “Key lock high security” embodiment where the phone displays a keypad after the home key is activated that prompts the user to enter a security code to unlock the phone. *Id.* ¶ 61. “Optionally,” the “additional security” in that embodiment can be “implemented by use of fingerprint identification, wherein the phone cannot be unlocked unless a fingerprint is authenticated.” *Id.*

2. Herfet

Herfet describes “a terminal for participating in services . . . subject to an access authorization” comprising “a camera for recording the fingerprint of a user and a comparison device for comparing the recorded fingerprint with a fingerprint stored in a data memory.” Ex. 1114, col. 1, ll. 3–6, 18–23. “[T]he image recording unit is disposed in the region of an on/off switch of the terminal,” resulting in “automatic activation of services with access authorization when the respective on/off switch of the terminal is actuated” and thus requiring “no additional effort for the user.” *Id.* at col. 1, ll. 38–43.

Figure 3 of Herfet is reproduced below.

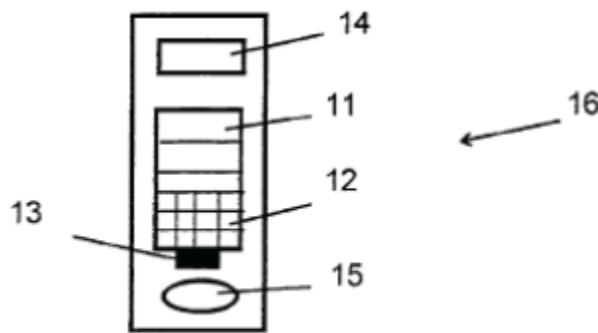


Fig. 3

Figure 3 depicts mobile telephone 16 comprising on/off switch 13, “behind which an image recording unit 5 is disposed.” *Id.* at col. 2, ll. 46–48, col. 3, ll. 26–32. Mobile telephone 16 “contains the same functional units as a conventional mobile radio device,” but for purposes of “access authorization” to services, includes “an automatic authentication which is disposed in the region of the on/off switch 13.” *Id.* at col. 3, ll. 33–39. Image recording unit 5 records the fingerprint of the user “during the switch-on process” and compares it to a fingerprint stored in memory for authentication. *Id.* at col. 2, ll. 48–50, col. 3, ll. 2–7 (“At the moment when the set is switched on, the fingerprint 6 of the user is recorded and

subsequently compared to the database . . .”). Herfet discloses that there is “a direct relationship between use, i.e. switching on/off, and authentication.” *Id.* at col. 3, ll. 9–11. Also, “[w]hen the terminal is not in use for an extended period of time, e.g. in standby mode, the authentication can be reset automatically; i.e. in this case the activation of services with access authorization is only possible after a renewed switch-on process.” *Id.* at col. 3, ll. 11–15. Herfet discloses that the authentication process “can be implemented in any type of multimedia terminal, in which an access authorization to specific services is required and the terminal is at the same time activated by switching on the device.” *Id.* at col. 3, ll. 16–20.

3. *Claim 1*

Petitioner argues that claim 1 is unpatentable over Goertz and Herfet under 35 U.S.C. § 103(a), relying on the testimony of Dr. Bederson as support. Pet. 40–53 (citing Ex. 1103). Patent Owner makes various arguments in response, relying on the testimony of Dr. Weaver. PO Resp. 40–51 (citing Ex. 2001); Sur-Reply 15–24.

a) Undisputed Issues

Petitioner relies on Goertz for certain limitations of claim 1. Pet. 43–53. For example, Petitioner argues that Goertz teaches a “mobile communication terminal” (i.e., mobile phone) comprising a “display unit” (i.e., touch screen) and “activation button” (i.e., home key), and performing a “user identification function” including “fingerprint recognition” (i.e., fingerprint identification). *Id.* Petitioner relies on a combination of Goertz with Herfet as teaching a “user identification unit.” *Id.* at 46–47. Petitioner argues that although Goertz teaches a computer and software for performing

the functions described in the reference, “to the extent” Goertz does not explicitly disclose a complete “user identification unit” performing a user identification function, Herfet teaches “a fingerprint scanner including image pickup unit 5, signal processing device 7, comparison device 8, and memory 9.” *Id.*

Patent Owner does not dispute that Goertz and Herfet teach these limitations of claim 1.⁷ Petitioner’s analysis for each of the limitations, supported by the testimony of Dr. Bederson, which we credit, is persuasive. *See id.* at 43–44, 46–47; Ex. 1103 ¶¶ 99–104, 106–110, 119.

b) Disputed Issues

(1) Activation Button

Claim 1 recites “an activation button configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit.” As explained above, we interpret “inactive state” to mean “a state in which the mobile communication terminal is communicable but a display screen is turned off, regardless of whether or not the mobile communication terminal performs a predetermined operation, and the mobile communication terminal is not completely turned off,” and interpret “active state” to mean “a state in which the display screen of the mobile communication terminal is turned on.” *See supra* Section II.B. Petitioner argues that Goertz teaches the recited functionality of an “activation button” (i.e., Goertz’s home key) by virtue of its description of the transition from Figure 13 to Figures 14 and 15 shown

⁷ We address the parties’ arguments as to whether a person of ordinary skill in the art would have been motivated to combine the teachings of Goertz and Herfet below. *See infra* Section II.E.3.b.(3).

above, where the device was locked previously by pressing the lock gadget shown on the screen in Figure 12. Pet. 45–46 (citing Ex. 1113 ¶¶ 24, 60, 61; Ex. 1103 ¶¶ 104–105).

Patent Owner argues that Goertz does not disclose the recited “activation button” that turns on a display unit in response to pressing the button. PO Resp. 41–42 (citing Ex. 2001 ¶¶ 120–121); *see* Sur-Reply 18. Patent Owner asserts that Goertz “never states or confirms that the display is off in Figure 13”; rather, Goertz discloses that the device is “locked,” which means that “activation of the phone is restricted in some manner.” PO Resp. 41–42 (quoting Ex. 1113 ¶ 60). According to Patent Owner, it is “equally plausible that Figure 13 is only emphasizing the action of pressing the home button,” and nothing in the written description of Goertz “addresses use of the home button to activate the display.” *Id.*

We disagree. Figure 12 of Goertz depicts a screen with a “lock gadget” that, when pressed, “causes the phone to lock.” Ex. 1113 ¶ 60. When in the locked state, pressing a button that normally would “activate a gadget” when unlocked does not activate the gadget. *Id.* “In order to unlock the phone, the user activates the home key” shown in Figure 13. *Id.* Figure 14 then “shows the phone after it has been unlocked: gadgets are now displayed on screen and are activated in response to user input.” *Id.* Figure 15 depicts an alternative screen that shows a keypad for entering a security code after the user presses the home key to unlock the device. *Id.* ¶ 61. Importantly, Figure 13 shows a blank area in the location of the screen (i.e., the display screen is turned off), whereas Figures 14 and 15 show content on the screen (i.e., the display screen is turned on). The written description of Goertz supports this reading, as it states that “gadgets are *now* displayed” in Figure 14 once the device is unlocked, indicating that they

were not previously in Figure 13 because the display screen was turned off. *See id.* ¶ 60 (emphasis added). Further, as Petitioner correctly points out, the phone of Figure 13 (in a locked state) appears similar to the phone of Figure 9 (with power turned off)—both have a blank area in the location of the screen, indicating that the display screen is turned off in both cases, and pressing the home key results in the display screen being turned on (as shown in Figures 10, 14, and 15).⁸ *See id.* ¶¶ 59–60 (disclosing that Figure 9 shows a phone “with a blank screen, indicating that power is off”); Reply 17–18. No other figure of Goertz shows such a display screen.

Thus, taking into account the full disclosure of Goertz, we do not agree with Patent Owner that it is “equally plausible” that the display screen is actually turned on in Figure 13. *See* PO Resp. 41–42; *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1166 (Fed. Cir. 2006) (explaining that in an obviousness analysis, “the prior art must be considered *as a whole* for what it teaches”). Rather, we are persuaded by Petitioner’s argument, supported by the testimony of Dr. Bederson, that a person of ordinary skill in the art would have understood Figure 13 to show a device in an “inactive state” where the display screen is turned off, and Figures 14 and 15 to show a device in an “active state” where the display screen is turned on, such that Goertz’s home key constitutes an “activation button” as recited in claim 1. *See* Pet. 45–46; Ex. 1103 ¶¶ 104–105; Ex. 1139 ¶¶ 55–56.

⁸ There is no dispute that the device as shown in Figure 9 is *entirely* powered off (i.e., the display screen cannot be on). *See* Reply 17–18; Sur-Reply 18. The fact that the locked state device shown in Figure 13 looks identical to the entirely powered off device in Figure 9 supports Petitioner’s reading that the display screen is turned off in both.

We find that Goertz teaches “an activation button configured to switch from an inactive state, which is an OFF state of the display unit, to an active state, which is an ON state of the display unit,” as recited in claim 1.

(2) “*Simultaneously*” Limitation

The “simultaneously” limitation recites (1) the performance of a “user identification function,” and (2) “switching from the inactive state of the display unit to the active state of the display unit by pressing the activation button.” As explained above, Petitioner relies on Goertz as teaching (1) the performance of a “user identification function” (i.e., fingerprint identification), and (2) switching from the inactive state of the display unit to the active state by pressing the home key. Pet. 45–47. Patent Owner does not dispute the first aspect of the “simultaneously” limitation, and we are persuaded by Petitioner’s arguments as to the second aspect for the reasons explained above. *See supra* Sections II.E.3.a, II.E.3.b.(1).

With respect to the remaining requirement that the user identification function be performed “simultaneously” with switching from an inactive state to an active state, Petitioner relies on the combined teachings of Goertz and Herfet. Pet. 47–53. Petitioner argues that Herfet teaches access authorization “performed simultaneously with the pressing of an on / off button . . . without additional user steps (user action).” *Id.* at 48. In particular, Petitioner points to Herfet’s disclosure of a “direct relationship” between switching on/off and authentication, where the user’s fingerprint is recorded “during the switch-on process,” i.e., “[a]t the moment” when the device is turned on, as well as Herfet’s disclosure of “automatic activation of services with access authorization when the respective on/off switch of the terminal is actuated [with] no additional effort for the user.” *Id.* at 48–49

(emphases omitted) (quoting Ex. 1114, col. 1, ll. 40–43, col. 2, l. 48–col. 3, l. 11). Petitioner further points out that Herfet’s “[s]witch-on’ processes . . . include waking from a standby mode,” i.e., transitioning from an inactive state to an active state. *Id.* at 49 (citing Ex. 1114, col. 3, ll. 11–15). In the proposed combination, Petitioner relies on Goertz for its teachings of fingerprint identification and switching the display screen from an inactive state to an active state by pressing the home key, and relies on Herfet for its teaching of simultaneous operations, namely performing both fingerprint recognition and powering on of the device based on a button press by the user, without additional steps. *Id.* at 47–50. According to Petitioner, a person of ordinary skill in the art would have applied Herfet’s access authorization functionality to Goertz such that the modified system “would have both initiated and performed the fingerprint recognition upon activating the home key without additional steps (user action).” *Id.* at 50.

Patent Owner argues that Goertz does not teach performing user identification “simultaneously” with switching to an active state because it utilizes a “two-step, sequential process.” PO Resp. 42–43 (citing Ex. 2001 ¶ 122); *see* Sur-Reply 16–18. We do not understand Petitioner to be arguing that Goertz alone teaches simultaneous performance. In its analysis of the “simultaneously” limitation, Petitioner relies on Herfet as allegedly teaching simultaneous performance, acknowledging that “Goertz does not explicitly disclose the details involved in the user identification function or when the function is to be performed (i.e., beyond proceeding to a step where fingerprint recognition is needed, Goertz does not explicitly disclose the details involved in actually performing the fingerprint recognition).” *See* Pet. 47–53; Tr. 18:1–6; *cf.* Pet. 31–32 (arguing with respect to Petitioner’s first ground that Fadell alone teaches simultaneous performance but, “to the

extent” it lacks “sufficient detail,” Gagneraud teaches it as well). Patent Owner’s argument, therefore, is inapposite, as it is not directed to Petitioner’s proposed combination.

Next, Patent Owner argues that “Herfet does not cure Goertz’s deficiencies” because “[l]ike Gagneraud, . . . Herfet’s authentication is one that occurs only ‘during the switch-on process’—i.e., when the device itself is powered on,” rather than when the display is being switched from an inactive state to an active state. PO Resp. 43–44 (citing Ex. 2001 ¶ 123); *see* Sur-Reply 18. Petitioner’s reasoning for the combination is very similar to that presented for its asserted ground based on Fadell, iOS, and Gagneraud, where Goertz is relied on as teaching switching from an inactive state to an active state and Herfet is relied on as teaching simultaneous operations—specifically, fingerprint recognition “during the switch-on process,” i.e., “[a]t the moment when the [device] is switched on”—such that the combination teaches the full “simultaneously” limitation. *See* Pet. 31–37, 47–53 (emphases omitted) (quoting Ex. 1114, col. 2, l. 48–col. 3, l. 11). We are persuaded by that analysis, which is supported by the testimony of Dr. Bederson, for the same reasons explained above. *See supra* Section II.D.4.b.(1).(b); Ex. 1103 ¶¶ 91–98, 104–114. Patent Owner’s argument again is inapposite, as it is directed to Herfet individually rather than the combination of Goertz and Herfet proposed by Petitioner. *See Bradium*, 923 F.3d at 1050; *Mouttet*, 686 F.3d at 1332–33. The fact that one reference lacks a feature present in the other does not negate Petitioner’s obviousness analysis.

Finally, Patent Owner disputes Petitioner’s characterization of Herfet’s “standby mode.” PO Resp. 44–45 (citing Ex. 2001 ¶ 124); *see* Sur-Reply 18–20. Petitioner, however, relies on Goertz, not Herfet

alone, for a teaching of the recited switching from an inactive state to an active state. Pet. 45–47. Regardless, though, we do not agree with Patent Owner’s argument. Herfet states that “[w]hen the terminal is not in use for an extended period of time, e.g. in standby mode, the authentication can be reset automatically; i.e. in this case the activation of services with access authorization is only possible after a renewed switch-on process.” Ex. 1114, col. 3, ll. 11–15. Patent Owner asserts that the phrase “renewed switch-on process” implies that when the device in Herfet enters the standby mode, “authentication is *only* performed when the device is turned off and back on.” PO Resp. 44–45. Petitioner responds that “[a] ‘renewed switch-on process’ is not turning the device off and back on, which would defeat the entire purpose of ‘standby mode.’” Reply 21–22.

We find that a person of ordinary skill in the art would have read Herfet in the manner described by Petitioner and Dr. Bederson. The cited portion of Herfet states that the device enters a “standby mode” when it is not used for a certain amount of time. Ex. 1114, col. 3, ll. 11–15. If the user always was required to turn the device off and back on to initiate authentication, there would be no difference between the standby mode and normal operation. Instead, “standby mode” suggests that the device is “standing by,” waiting for activation by the user via a “renewed switch-on process” triggered by pressing the button with the fingerprint scanner (just as the user would do to turn the device on). *See id.* at col. 2, l. 43–col. 3, l. 20. We credit the following explanation from Dr. Bederson, which is consistent with, and a logical reading of, the language used in Herfet:

A “renewed switch-on process” is not turning the device off and back on, which would defeat the entire purpose of the “standby mode.” Rather, it is how Herfet refers to bringing the device out of standby mode (i.e., from an inactive to an active state).

Regardless of whether the terminal is completely off or in a standby mode, when the user decides to access the terminal, the user will switch on the terminal. In other words, to turn on the device from a completely off state, the user switches on the terminal, and to turn on the device from a standby mode, the user switches on the terminal. There is no disclosure in Herfet that there are any additional steps (or conditions) to turn on the device from the standby mode, and there is no disclosure in Herfet indicating that “switching on” must be from a completely off state.

See Ex. 1139 ¶ 61 (emphasis omitted).

We find that the combination of Goertz and Herfet teaches the limitation of claim 1 that “the user identification function is performed simultaneously with switching from the inactive state of the display unit to the active state of the display unit by pressing the activation button.”

(3) Motivation to Combine With Herfet

Petitioner argues that a person of ordinary skill in the art would have been able and motivated to modify Goertz’s mobile phone based on the teachings of Herfet. Pet. 49–53. Specifically, Petitioner argues that an ordinarily skilled artisan would have been motivated to “modify Goertz’s high security lock unlocking functionality such that when the home key is activated, as disclosed by Goertz, fingerprint recognition would be performed, as taught by Herfet, thereby implementing the user identification function simply and without ‘additional effort for the user.’” *Id.* at 50 (emphases omitted) (quoting Ex. 1114, col. 1, ll. 40–43).

According to Petitioner, “[b]ecause Goertz discloses that activating the home key turns on the display and further engages higher security (such as fingerprint recognition) when applicable, but does not explain the details of how fingerprint recognition would have been implemented,” a person of

ordinary skill in the art would have looked to art like Herfet that describes fingerprint recognition and “provides the benefit of a simple user experience.” *Id.* at 50–52 (citations omitted). The proposed combination with Herfet would have been merely the “application of a known technique (Herfet’s specific fingerprint recognition technique) to improve a similar device (Goertz’s phone that is described, generically, as having a fingerprint recognition requirement) in the same way (to provide a simple authentication implementation).” *Id.* at 51–52. Petitioner further explains that

a [person of ordinary skill in the art] would have known that the disclosures and teachings of Goertz and Herfet would have had wide applicability in the art of electronic devices. This is because their teachings relate to fundamental human-computer interaction concepts such as (1) determining that a user is indicating their initial interaction with a device, and (2) determining whether that user should be allowed to interact with the device. For example, Herfet teaches that fingerprint recognition should be performed simultaneously with pressing its “on/off” switch, and that such switch-on usage includes the action of waking a device from standby mode. Thus, whether the user action of activating a switch is to turn a device on (i.e., from completely off) or simply waking from a standby mode has no bearing on the underlying question of whether the user is indicating their initial interaction with the device. As Goertz shows, a single activation button can be configured for both functions and more. A [person of ordinary skill in the art] would have understood that the concept of fingerprint identification would have been needed for, and applicable to, any process in which the device has not been in active use (among other situations) and a user signals that they are initiating interactions with some function of the device. Thus any button that would have been used to wake a device—i.e., the first button being pressed by the user—would have been an obvious candidate for the convenience factor desired in Herfet.

Id. at 50–51 (citations and emphases omitted).

Finally, Petitioner argues that a person of ordinary skill in the art would have had a reasonable expectation of success in modifying Goertz as explained above because, for example, “Goertz already discloses the use of fingerprint recognition but is . . . silent as to its specific details” and implementation would only have involved receiving an input and comparing it to “a stored unlock input,” which was a “standard and normal procedure.” *Id.* at 52–53. Dr. Bederson provides supporting testimony for Petitioner’s contentions. *See* Ex. 1103 ¶¶ 114–118.

Patent Owner makes four arguments in response. First, Patent Owner again argues that Petitioner and Dr. Bederson do not explain sufficiently why “determining that a user is indicating their initial interaction with a device” (e.g., waking from a locked state as in Goertz, powering on as in Herfet) constitutes a “fundamental human-computer interaction concept[.]” PO Resp. 45–48 (citing Ex. 2001 ¶¶ 125–129); *see* Sur-Reply 20–22; Ex. 2001 ¶ 129 (Dr. Weaver stating that he is “unaware of any human-computer interaction literature” identifying such a determination as a “particularly important concept”).

For the same reasons explained above, we find that the similarity between the references’ teachings regarding initial interaction with a device is some evidence of whether a person of ordinary skill in the art would have thought to combine them. *See supra* Section II.D.4.b.(2). Again, though, that similarity is only one aspect of Petitioner’s motivation to combine analysis. More important is the *express* motivation in Herfet itself. *See* Pet. 50; Reply 22–24; *Brown & Williamson*, 229 F.3d at 1125. Herfet states that its process “results in an automatic activation of services with access authorization when the respective on/off switch of the terminal is actuated,” with “no additional effort by the user.” Ex. 1114, col. 1, ll. 40–43; *see also*

id. at col. 2, ll. 14–19, 43–46 (disclosing that authentication is “automatic” and triggered “solely” by turning the device on). Therefore, modifying Goertz’s locking functionality “such that when the home key is activated, . . . fingerprint recognition would be performed, as taught by Herfet, [would] implement the user identification function simply and without ‘additional effort for the user.’” *See* Reply 22–23 (quoting Ex. 1114, col. 1, ll. 40–43). Herfet simplifies and improves on Goertz’s process by removing the need for additional actions by the user. We find this to be the most probative evidence of why a person of ordinary skill in the art would have thought to combine Goertz and Herfet. Patent Owner disagrees that the proposed combination would simplify Goertz’s process because Herfet allegedly “involves a convoluted process of turning a device in standby mode off and back on to authenticate a user.” Sur-Reply 21–22. But we also disagree with Patent Owner’s reading of Herfet’s standby mode disclosure for the reasons stated above. *See supra* Section II.E.3.b.(2).

Second, Patent Owner contends that a person of ordinary skill in the art would not have combined Goertz and Herfet because they both teach authenticating a user in different ways—with a multi-step process in Goertz and a simultaneous process in Herfet—and “[w]hen two references already accomplish similar functions by different means, one of skill in the art would not be motivated to combine them.” PO Resp. 48 (citing Ex. 2001 ¶ 130; *Kinetic Concepts*, 688 F.3d at 1369); *see* Sur-Reply 22–23. We are not persuaded for reasons similar to those explained above. *See supra* Section II.D.4.b.(2). The proposed combination with Herfet improves Goertz’s process by simplifying it and removing the need for additional effort by the user.

Third, Patent Owner argues that Herfet “teaches away from the proposed combination by restricting its application to the power-on sequence.” PO Resp. 49–50 (citing Ex. 2001 ¶ 131); *see* Sur-Reply 23. Patent Owner argues that based on Herfet’s description of a “renewed switch-on process” when exiting standby mode, “the device must be powered off and back on” to perform user authentication. PO Resp. 49–50 (citing Ex. 1114, col. 3, ll. 11–15). We disagree with Patent Owner’s reading of Herfet’s standby mode disclosure for the reasons stated above. *See supra* Section II.E.3.b.(2). Patent Owner further contends that Herfet “limits its scope to ‘any type of multimedia terminal, in which an access authorization to specific services is required and the terminal is at the same time activated *by switching on the device.*’” PO Resp. 49 (quoting Ex. 1114, col. 3, ll. 16–20). In the same paragraph as the cited disclosure, however, Herfet states that “the invention is not limited to this field.” Ex. 1114, col. 3, ll. 16–25. Further, “[a] reference that ‘merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into’ the claimed invention does not teach away.” *Meiressone v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017) (citation omitted). Although Herfet discloses authentication performed in one context (i.e., when a user presses a button to power on the device), based on the full record developed during trial, we do not see anything in the reference that criticizes, discredits, or otherwise discourages authentication in a similar context in which the user is indicating his or her initial interaction with a device, namely when the user is pressing a button to wake the device (as disclosed in Goertz).

Fourth, Patent Owner argues that Petitioner’s asserted grounds fail because “Petitioner has not identified any prior art reference that discloses

an *activation button* that both activates the display and simultaneously causes the performance of fingerprint recognition (or any user identification function).” PO Resp. 50–51 (citing Ex. 2001 ¶¶ 132–133); *see* Sur-Reply 23–24. Again, Patent Owner is correct that no single reference discloses the claim limitations at issue, but Petitioner’s obviousness theory is premised on the *combination* of Goertz and Herfet. Petitioner has provided sufficient reasoning for why a person of ordinary skill in the art would have been motivated to combine the teachings of the references in the manner asserted and would have had a reasonable expectation of success in doing so.

c) Conclusion

For the reasons set forth by Petitioner and explained above, we are persuaded that Goertz and Herfet collectively teach all of the limitations of claim 1, and that a person of ordinary skill in the art would have been motivated to combine the references’ teachings to achieve the mobile communication terminal recited in the claim and would have had a reasonable expectation of success in doing so. Petitioner has proven, by a preponderance of the evidence, that claim 1 would have been obvious based on Goertz and Herfet under 35 U.S.C. § 103(a).

4. Claims 8, 9, and 15

Largely referring to its analysis of claim 1, Petitioner explains how the limitations of claim 9 are taught by the combination of Goertz and Herfet, with supporting testimony from Dr. Bederson. *See* Pet. 40–54; Ex. 1103 ¶¶ 91–119, 123–125. With respect to dependent claims 8 and 15, which recite “comparing a fingerprint acquired by the activation button to pre-stored fingerprint information of a user,” Petitioner argues that Herfet

teaches comparison device 8 “compar[ing] the signal provided by the signal processing device with signals of a fingerprint stored in a memory 9.”

Pet. 53–55 (quoting Ex. 1114, col. 2, ll. 50–56; citing Ex. 1114, col. 3, ll. 2–7; Ex. 1103 ¶¶ 120–122, 126). Patent Owner argues independent claims 1 and 9 together in its Response and Sur-Reply, and does not argue separately dependent claims 8 and 15. *See* PO Resp. 40–51; Sur-Reply 15–24. We disagree with Patent Owner’s arguments for the reasons explained above. *See supra* Section II.E.3.b. We have reviewed Petitioner’s contentions and supporting evidence, including the testimony of Dr. Bederson, and are persuaded that Petitioner has proven, by a preponderance of the evidence, that claims 8, 9, and 15 would have been obvious based on Goertz and Herfet under 35 U.S.C. § 103(a), for the reasons stated by Petitioner.

III. CONCLUSION⁹

Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 8, 9, and 15 of the '557 patent are unpatentable. In summary:

Claims	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1, 8, 9, 15	103(a)	Fadell, iOS, Gagneraud	1, 8, 9, 15	
1, 8, 9, 15	103(a)	Goertz, Herfet	1, 8, 9, 15	
Overall Outcome			1, 8, 9, 15	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 8, 9, and 15 of the '557 patent have been shown to be unpatentable.

This is a final decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

⁹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), 42.8(b)(2).

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